

In general, use of the term “input device” is intended to include all possible types of devices and ways to input information into computer system 710 or onto a communication network.

User interface output devices 720 may include a display subsystem, a printer, a fax machine, or non-visual displays such as audio output devices. The display subsystem may include a cathode ray tube (CRT), a flat-panel device such as a liquid crystal display (LCD), a projection device, or some other mechanism for creating a visible image. The display subsystem may also provide non-visual display such as via audio output devices. In general, use of the term “output device” is intended to include all possible types of devices and ways to output information from computer system 710 to the user or to another machine or computer system.

Storage subsystem 724 stores programming and data constructs that provide the functionality of some or all of the modules described herein. For example, the storage subsystem 724 may include the logic to perform selected aspects of method 400, method 500, method 600, state diagram 300, and/or to implement one or more of the server device 102, the remote device 112, the engagement prediction engine 110, the automated assistant 104, the personal computing device 140, the vehicle computing device 122, the contacting computing device 130, the remote device 202, the remote device 208, the vehicle computing device 212, or the personal computing device.

These software modules are generally executed by processor 714 alone or in combination with other processors. Memory 725 used in the storage subsystem 724 can include a number of memories including a main random access memory (RAM) 730 for storage of instructions and data during program execution and a read only memory (ROM) 732 in which fixed instructions are stored. A file storage subsystem 726 can provide persistent storage for program and data files, and may include a hard disk drive, a floppy disk drive along with associated removable media, a CD-ROM drive, an optical drive, or removable media cartridges. The modules implementing the functionality of certain implementations may be stored by file storage subsystem 726 in the storage subsystem 724, or in other machines accessible by the processor(s) 714.

Bus subsystem 712 provides a mechanism for letting the various components and subsystems of computer system 710 communicate with each other as intended. Although bus subsystem 712 is shown schematically as a single bus, alternative implementations of the bus subsystem may use multiple busses.

Computer system 710 can be of varying types including a workstation, server, computing cluster, blade server, server farm, or any other data processing system or computing device. Due to the ever-changing nature of computers and networks, the description of computer system 710 depicted in FIG. 7 is intended only as a specific example for purposes of illustrating some implementations. Many other configurations of computer system 710 are possible having more or fewer components than the computer system depicted in FIG. 7.

In situations in which the systems described herein collect personal information about users (or as often referred to herein, “participants”), or may make use of personal information, the users may be provided with an opportunity to control whether programs or features collect user information (e.g., information about a user’s social network, social actions or activities, profession, a user’s preferences, or a user’s current geographic location), or to control whether and/or how to receive content from the content server that

may be more relevant to the user. Also, certain data may be treated in one or more ways before it is stored or used, so that personal identifiable information is removed. For example, a user’s identity may be treated so that no personal identifiable information can be determined for the user, or a user’s geographic location may be generalized where geographic location information is obtained (such as to a city, ZIP code, or state level), so that a particular geographic location of a user cannot be determined. Thus, the user may have control over how information is collected about the user and/or used.

We claim:

1. A method implemented by one or more processors, the method comprising:

receiving, at computing device that provides access to an automated assistant application, a message when a user is participating in an activity, wherein the message is directed to the user of the computing device from a separate computing device that is operated by a separate user, and

wherein the computing device includes activity data that characterizes the activity that the user is participating in and a level of engagement exhibited by the user when the user is participating in the activity;

determining, based on the activity data and receiving the message, that a query included in the received message is associated with the activity;

determining, based on determining that the query is associated with the activity, that the activity data identifies information that satisfies a criteria for answering the query without explicit user interface input provided by the user in furtherance of responding to the message; generating, based on determining that the activity data identifies information that satisfies the criteria, a responsive message that is based on the information identified by the activity data;

causing, based on generating the responsive message, the responsive message to be transmitted to the separate computing device;

determining that the level of engagement satisfies one or more threshold levels of engagement for causing the automated assistant application to limit, while the user is participating in the activity, provisioning of a notification regarding the message; and

causing, based on the level of engagement satisfying the one or more threshold levels of engagement, the computing device to limit rendering of the notification until the user is no longer participating in the activity.

2. The method of claim 1, wherein the information satisfies the criteria for answering the query when the automated assistant application determines that the information can be used to generate one or more responses to the query associated with the activity.

3. The method of claim 1, further comprising:

causing, based on the level of engagement satisfying the one or more threshold levels of engagement, the computing device to select a modality for rendering a different version of the notification while the user is participating in the activity.

4. The method of claim 3, wherein the notification is rendered by the computing device via a different modality subsequent to the user ceasing participation in the activity.

5. The method of claim 1, wherein the information characterizes an intent of the user to perform the activity at a particular time, and the query elicits the user to provide the particular time for the activity.